REMARKS

Claims 1-8, 10-20 and 22-25 are pending in the application. In the Office Action made Final, those claims are rejected.

In particular, Claims 1, 2, 10-14 and 22-25 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Takayama in view of Schonberg. In addition, Claims 3, 4, 15 and 16 are rejected under Section 103(a) as being unpatentable over Takayama, Schonberg and Karlen. Furthermore, Claims 5-7 and 17-19 are rejected under Section 103(a) as being unpatentable over Takayama, Schonberg and Skaalen. Finally, Claims 1-3, 8, 13-15, 20 and 25 are rejected under Section 103(a) as being unpatentable over Mihara in view of Nunan. In response to the Section 103(a) rejections, the Applicant respectfully submits that Claims 1, 3-8, 10-13, 15-20 and 22-25, as amended, are not obvious in view of Takayama, Schonberg, Karlen, Skaalen, Mihara and Nunan. Reconsideration is respectfully requested.

Claim 1, as amended, recites an apparatus for irradiating surfaces including an electron beam generator for generating a beam of electrons. The beam of electrons exits the electron beam generator through an exit window. A robotic device moves the beam of electrons over the surfaces to irradiate selected regions of the surfaces. The robotic device can include a robotic arm for maneuvering the electron beam generator, and a propulsion system for propelling the robotic device in a manner where the entire robotic device is capable of traveling to desired locations. The robotic device is capable of controllably spacing the exit window of the electron beam generator a desired distance away from the surfaces as the electron beam generator is moved over the surfaces by both maneuvering by the robotic arm and by travel of the entire robotic device.

Claim 13 recites a method of irradiating surfaces and Claim 25 recites a method of forming an apparatus for irradiating surfaces. Claims 1 and 25 have been amended to recite "the robotic device including a robotic arm for maneuvering the electron beam generator" and "the robotic device capable of controllably spacing the exit window of the electron beam generator a desired distance away from the surfaces as the electron beam generator is moved over the surfaces by both maneuvering by the robotic arm and by travel of the entire robotic device." Claim 13 has been amended in similar fashion. Claims 3, 15 and 16 have also been amended for

consistency. Support for these amendments is found at least in FIGS. 10-17, 27 and 23, as well as on page 17, lines 2-15 of the Specification as originally filed. No new matter is introduced.

In the present invention, the propulsion system allows the entire robotic device, including its base to which the robotic arm is attached, to be mobile and driven to desired locations for use. This can enable the robotic device to travel long distances while irradiating surfaces. The robotic arm can maneuver the electron beam generator for desired positioning. For example, in Figs 11, 13 and 14, the robotic device can travel to different locations within a room 112 so that surfaces of different areas of the room 112 can be irradiated by an electron beam generator on a maneuverable arm 99. Furthermore, in Fig. 17, the robotic device can travel around an object 115 while irradiating the exterior surfaces. In addition to irradiating areas that can be distant from each other, large continuous surfaces or areas can be irradiated, for example, in large buildings. Such a robotic device and propulsion system can provide maneuverability and flexibility, and allows large rooms or objects to be irradiated, including those with unusual geometry. The exit window of the electron beam generator can be controllably spaced a desired distance away from the surfaces during irradiation as the electron beam generator is moved over the surfaces by both maneuvering by the robotic arm and by movement of the entire robotic device as it travels.

In contrast, Takayama discloses in Fig. 6 an arm driving robot 23 having a main body 20 and optical sensor 21 that are mounted to an articulated expansion arm 22. The main body 20 includes an irradiation tube 27. Only the arm 22 is driven for moving the irradiation tube 27 over the surfaces of a substrate 30, as can been seen in Fig 6 and described on Column 8, lines 5-23 The location of the base of the robot 23 remains stationary, so that the entire robot 23 never travels to desired locations.

Schonberg discloses in FIG. 2(b) an electron beam therapy system for treating patients, having a set of wheels 54 to facilitate moving the system from one operating room to another. Once in place, a set of support feet 56 can be lowered for stabilization, or a brake can be set on the wheels 54. Schonberg does not disclose a propulsion system.

Accordingly, Claims 1, 10-13 and 22-25, as amended, are not obvious in view of Takayama and Schonberg since neither reference, alone or in combination, teaches or suggests "a robotic device for moving the beam of electrons over the surfaces to irradiate selected regions of

the surfaces, the robotic device including a robotic arm for maneuvering the electron beam generator, and a propulsion system for propelling the robotic device in a manner where the entire robotic device is capable of traveling to desired locations, the robotic device capable of controllably spacing the exit window of the electron beam generator a desired distance away from the surfaces as the electron beam generator is moved over the surfaces by both maneuvering by the robotic arm and by travel of the entire robotic device", as recited in Claim 1, as amended, and similarly in Claims 13 and 25, as amended. Reconsideration is respectfully requested.

Karlen discloses a robot having an arm with a series of roll joints 2, 6, 10, and 14, and a series of pitch joints 4, 8 and 12. The robot itself in Karlen is stationary and does not travel

Accordingly, Claims 3, 4, 15 and 16, are not obvious in view of Takayama, Schonberg and Karlen, since none of the references, either alone or in combination, teach or suggest "a robotic device for moving the beam of electrons over the surfaces to irradiate selected regions of the surfaces, the robotic device including a robotic arm for maneuvering the electron beam generator, and a propulsion system for propelling the robotic device in a manner where the entire robotic device is capable of traveling to desired locations, the robotic device capable of controllably spacing the exit window of the electron beam generator a desired distance away from the surfaces as the electron beam generator is moved over the surfaces by both maneuvering by the robotic arm and by travel of the entire robotic device", as recited in base Claim 1, as amended, and similarly in base Claim 13 as amended Reconsideration is respectfully requested.

Skaalen discloses a straddle-lift container handler having four powered and steerable wheels. The vehicle is driven by a person located in the operator cab 63 on top of the vehicle (FIG. 1).

Accordingly, Claims 5-7 and 17-19 are not obvious in view of Takayama, Schonberg and Skaalen, since none of the references, either alone or in combination, teach or suggest "a robotic device for moving the beam of electrons over the surfaces to irradiate selected regions of the surfaces, the robotic device including a robotic arm for maneuvering the electron beam generator, and a propulsion system for propelling the robotic device in a manner where the entire robotic device is capable of traveling to desired locations, the robotic device capable of controllably spacing the exit window of the electron beam generator a desired distance away from the surfaces as the electron beam generator is moved over the surfaces by both maneuvering by the robotic

arm and by travel of the entire robotic device", as recited in base Claim 1, as amended, and similarly in base Claim 13, as amended.

Mihara discloses an x-ray treatment apparatus 1 (FIG. 1) including a head 6 having an x-ray generator 8 (FIG. 2). The head 6 can be manipulated by a manipulator 5 which can slide on linear rails 2 for movement into a position for focusing on the patient (see column 3, lines 62-63 and column 4, lines 27-39). The head 6 is stationary during treatment.

Nunan discloses an x-ray and electron therapy machine. The beam can be scanned over the patient by moving the patient with movement of the patient table. The machine does not travel.

Accordingly, Claims 1, 3, 8, 13, 15, 20 and 25, as amended, are not obvious in view of Mihara and Nunan, since neither reference, alone or in combination, teaches or suggests "a robotic device for moving the beam of electrons over the surfaces to irradiate selected regions of the surfaces, the robotic device including a robotic arm for maneuvering the electron beam generator, and a propulsion system for propelling the robotic device in a manner where the entire robotic device is capable of traveling to desired locations, the robotic device capable of controllably spacing the exit window of the electron beam generator a desired distance away from the surfaces as the electron beam generator is moved over the surfaces by both maneuvering by the robotic arm and by travel of the entire robotic device", as recited in Claim 1, as amended, and similarly in Claims 13 and 25, as amended. Therefore, Claims 1, 3-8, 10-13, 15-20 and 22-25, as amended, are in condition for allowance. Reconsideration is respectfully requested.

CONCLUSION

In view of the above amendments and remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If

the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.

By _____

Darrell L. Wong
Registration No. 36,725
Telephone: (978) 341-0036
Facsimile: (978) 341-0136

Concord, MA 01742-9133
Dated: 10/27/2006